-----Original Message-----
From Hays, David C Jr CIV USARMY CENWK (USA) <David.C.Hays@usace.army.mil>
Sent Friday, July 26, 2019 9 19 AM
To Walker, Stuart <Walker.Stuart@epa.gov>
Cc Clements, Julie A CIV (USA) <Julie.A.Clements@usace.army.mil>
Subject FW Request for USACE review draft of Peak PRG option in PRG calculator

Stuart, tool seems to work well. Some minor comments are below. Sorry for my delay.

1. When you are looking at the graphics there is an option to save the file (the camera icon). When you place your cursor on the camera icon a message pops up and says "Download the file as a png." When you click on the camera icon, the file is saved as a Scalable Vector Graphics (.svg) file.

2. When you save the graphics file the graph summary information in the grey box is not saved (final peak risk PRG, peak risk start time, peak risk end time, and peak risk)

3. The graph title needs clarification. As an example for Ra-226 for resident soil, the title reads "Ra-226 Peak Risk for Residential Soil at 26 years." The 26 years is the exposure duration for the resident scenario. It does change to 25 years for the other scenarios. It would be clearer if the phrase "exposure duration" was added Ra-226 Peak Risk for Residential Soil at 26 years exposure duration

4. The decay tables used are from ICRP 107 and the branching fractions for the uranium and thorium series are correct.

5. Reuse of colors to identify isotopes in the graphs can be confusing.

6. The years axis should scale to fit half lives or risk rates? Shorter half life isotopes like H-3 the time of peak dose is start of scale (E-17 years) and drops to 0 relatively quickly compared to U-238. Having a fixed year axis somewhat limits the usability of the graph.

7. Consider reducing the number of significant digits used to determine start and end of peak risk times. As an example the graph data for Th-232 shows peak risk from 50 years to over 100 M years as flat with very minor changes (E-8) as to be expected given half lives but the start and end of peak risk in heading spans only 26 years. I may not fully understand how this data is expected to be used however, thus just a recommendation.

From: Walker Stuart
Sent: Tuesday June 25 2019 8:09 PM
To: Garufi Katherine <Garufi.Katherine@epa.gov>
Cc: Dolislager Fredrick G. <dolislagerf1@ornl.gov>
Subject: draft of Peak PRG option in PRG calculator

Hello Kate,

Can you please ask the ACE to perform a quick review of a draft addition to the PRG calculator. I would like comments with 2 weeks if possible. There is no text to review, this involves playing around with a draft edition of the calculator portion only of the PRG calculator website.

The tool is located at https://prg-test.ornl.gov/cgi-bin/radionuclides/rprg_peak

with the user [redacted] and pwd [redacted]

The option under review provides PRGs for the parent isotope and all daughters assuming the peak years of risk. This will eventually be incorporated into the PRG calculator as a PRG Output option but as an intermediate step we have it separate while an early draft to not interfere with other updates to the PRG calculator.

A few things to note

1) Peak tool only considers direct media - soil air tap or groundwater (no biota/plants)
2) Initial PRGs for the solver are without decay; solver incorporates decay with risk at each time series point in the ODE routine
3) Peak output is individual per Parent/Media combination so beware of "Select All" or many simultaneously as it may crash or stall
4) Risk output does not function.

fyi below are some comments I already discussed with Oak Ridge programmers on the draft tool.

1. On the results page we should probably put the total PRG highlighted with the parent and daughter similar to the way we show SE results when the daughters are shown. I got this result for Cs-137

Composite Worker PRGs for Soil

Parent = Cs-137

Isotope	Particulate Emission Factor (m^3/kg)	Lambda (1/yr)	Halflife (yr)	Default Soil Volume Area Correction Factor	Default Soil Volume Gamma Shielding Factor	Ingestion PRG TR=1E-06 (pCi/g)	Inhalation PRG TR=1E-06 (pCi/g)	External Exposure PRG TR=1E-06 (pCi/g)	Total PRG TR=1E-06 (pCi/g)	Total PRG TR=1E-06 (mg/kg)
Cs-137	1.36E+09	2.30E-02	3.02E+01	1.00E+00	1.00E+00	5.03E+01	9.67E+04	3.17E+02	**4.34E+01**	5.03E-07
Ba-137m	1.36E+09	1.43E+05	4.86E-06	1.00E+00	1.00E+00	-	-	6.52E-02	**6.52E-02**	1.22E-16

The format for SE like this would be better

Site-Specific

Composite Worker Individual Contribution PRGs for Soil - Secular Equilibrium

Isotope	ɔda r)	Halflife (yr)	1000029 m² Soil Volume Area Correction Factor	0 cm Soil Volume Gamma Shielding Factor	Ingestion PRG TR=1E-06 (pCi/g)	Inhalation PRG TR=1E-06 (pCi/g)	External Exposure PRG TR=1E-06 (pCi/g)	Total PRG TR=1E-06 (pCi/g)	Total PRG TR=1E-06 (mg/kg)
*Secular Equilibrium PRG for Cs-137		-	-	-	5.03E+01	9.67E+04	6.91E-02	6.90E-02	-
Ba-137m	-05	4.86E-06	1.00E+00	1.00E+00	-	-	6.91E-02	**6.91E-02**	2.70E-14
Cs-137	02	3.02E+01	1.00E+00	1.00E+00	5.03E+01	9.67E+04	3.17E+02	**4.34E+01**	2.66E-10

Then I forgot to go lower for the total PRG that incorporates Cs-137 and Ba-137 (see above the thick pink line I added)

Decay information for Cs-137

Peak for Cs-137 (Soil)

Final Peak Risk PRG = 9.066E-02 pCi/g
Peak Risk Start Time = 9.714E-17 years
Peak Risk End Time = 2.500E+01 years
Peak Risk = 5.797E-07